

## Problem Set #5

Due at the beginning of lecture Wednesday, October 27, 2010

NOTE: To ensure proper grading, write your answers in the area indicated.

In the central part of the state of Euphoria there is a small city, Avicenna, which is the home of Euphoric State University. ["Avicenna" is a corruption of the Arabic Ibn Sina, the byname of the great eleventh-century Iranian Abu Ali al-Husayn ibn Abd Allah ibn Sina: academic administrator, Quran reciter, astronomer, chemist, geologist, psychologist, theologian, mathematician, physicist, physician, poet, and paleontologist.]

For the next several questions, we will look at the daily market for espresso-based drinks in Avicenna.

1. Suppose that the quantity of espresso drinks demanded ( $Q_D$ ) and the quantity of espresso drinks supplied ( $Q_S$ ) are given by the equations:

$$Q_D = 10,000 - 1000P$$

$$Q_S = -5000 + 4000P$$

where  $P$  is the price of an espresso-based drink in dollars.

- a. What is the market equilibrium price?

- b. What is the market equilibrium quantity?

- c. What is the producer surplus?

- d. What is the consumer surplus?

2. Now suppose that PDC becomes alarmed at the number of strokes that are being treated at the public hospitals of Euphoria, and becomes aware of the link between caffeine consumption and blood pressure on the one hand and between blood pressure and strokes on the other. They decide to impose on consumers a \$1/drink tax on espresso drinks and devote the money to hospital stroke-care units.
- a. What is the equilibrium price that consumers pay?
  
  
  
  
  
  
  
  
  
  
  - b. What is the equilibrium price that producers receive?
  
  
  
  
  
  
  
  
  
  
  - c. What is the equilibrium quantity?
  
  
  
  
  
  
  
  
  
  
  - d. How much money is raised for hospital stroke care units?
  
  
  
  
  
  
  
  
  
  
  - e. What is the producer surplus?
  
  
  
  
  
  
  
  
  
  
  - f. What is the consumer surplus?
  
  
  
  
  
  
  
  
  
  
  - g. What is the change in the producer surplus relative to the market equilibrium?
  
  
  
  
  
  
  
  
  
  
  - h. What is the change in the consumer surplus relative to the market equilibrium?

- i. What are the arguments that this tax on espresso drinks is a good idea?
  
  
  
  
  
  
  
  
  
  
- j. What are the arguments that this tax on espresso drinks is a bad idea?
  
  
  
  
  
  
  
  
  
  
3. Now let us return to the market equilibrium. PDC now notes that baristas have low security of employment and often suffer from spells of unemployment. They decide to impose on producers a \$1/drink tax to establish a social welfare fund for baristas.
  - a. What is the equilibrium price that consumers pay?
  
  
  
  
  
  
  
  
  
  
  - b. What is the equilibrium price that producers receive?
  
  
  
  
  
  
  
  
  
  
  - c. What is the equilibrium quantity?
  
  
  
  
  
  
  
  
  
  
  - d. How much money is raised for hospital stroke care units?
  
  
  
  
  
  
  
  
  
  
  - e. What is the producer surplus?
  
  
  
  
  
  
  
  
  
  
  - f. What is the consumer surplus?

- g. What is the change in the producer surplus relative to the market equilibrium?
  
  
  
  
  
  
  
  
  
  
- h. What is the change in the consumer surplus relative to the market equilibrium?
  
  
  
  
  
  
  
  
  
  
- i. What are the arguments that this tax on espresso drinks is a good idea?
  
  
  
  
  
  
  
  
  
  
- j. What are the arguments that this tax on espresso drinks is a bad idea?
  
  
  
  
  
  
  
  
  
  
- 4. What are the differences between your answers to question 2 and question 3?





- b. How many people will want to sign up for yoga lessons?
  
- c. What is the average valuation the people who want to sign up place on yoga lessons?
  
- d. Suppose that the average person who succeeds in signing up has the average valuation among all those who wish to sign up. What, then, is the consumer surplus?
  
- e. What is the producer surplus?
  
- f. Who has gained and who has lost from this decree relative to the market equilibrium, and how much?
  
- g. Can you think of a reason why this decree from the PDC might be popular?
  
- h. Suppose it is your job to argue that the decree should be repealed. What would you say?
  
- i. In ancient Athens there was a crime—punishable by death or fine—of having convinced the Assembly of Athens to pass a bad decree: γραφή παρανόμων. Do you think those who persuaded PDC to pass this decree should be tried and punished for this crime? Why or why not?

8. Now suppose that somebody stands up at PDC and gives a persuasive speech that yoga is an alien fitness discipline and that we should be encouraging all-American forms of exercise—like hot-dog eating contests. As a result, PDC passes a decree that no more than 20 people should take yoga lessons a day. However, they do not restrict the price that those lucky enough to be allowed to offer the 20 lessons can charge.
- To what price will consumers bid up the price of yoga lessons?
  - What will the consumer surplus be?
  - What is the average reservation price for which potential yoga teachers will want to teach yoga lessons?
  - Suppose that the average teacher who succeeds in signing up to give the 20 lesson slots has the average valuation among all those who wish to sign up. What, then, is the producer surplus?
  - Who has gained and who has lost from this decree relative to the market equilibrium, and how much?
  - Can you think of a reason why this decree from the PDC might be popular?
  - Suppose it is your job to argue that the decree should be repealed. What would you say?
  - Do you think those who persuaded PDC to pass this decree should be tried and punished for convincing PDC to pass a bad decree? Why or why not?





10. Let us remain in the far north of Euphoria. MEC refuses to pay your bill. Annoyed, you go to the Redwood Collective for Culture and argue that they should take on the business of showing movies as a non-profit. The RCC is—let us suppose—an efficient organization, able to actually rent a theater, rent a print of the movie, collect money, and not have it stolen. The only constraint on the RCC is that it has to break even.
- At what price charged per ticket does the RCC break even—that is, collect the \$420 it needs to run its operations?
  - What is the consumer surplus when the RCC breaks even?
  - How does that compare to the consumer surplus in question 9, when the profit-maximizing entrepreneurial Company showed the movies?
  - How does that compare to the sum of the consumer and producer surplus in question 9, when the profit-maximizing Entrepreneurial Company showed the movies?
  - Which comparison—that of consumer surplus with the RCC to consumer surplus with the profit-making EC in part (c), or that of consumer surplus with the RCC to consumer plus producer surplus with the profit-making EC in part (d)—is the best one to keep in mind in guiding your analysis of whether classic Japanese cinema in Ihavefoundit should be shown by a private company or by a nonprofit organization?

11. Suppose that PDC for the state of Euphoria now calls you up and asks whether they should give the RCC a \$420 grant from public funds—have movies shown not by a for-profit company and not by a non-profit collective but instead by a public movie-showing program.

a. What price per ticket does the RCC now have to charge to take even?

b. What is the consumer surplus now when the RCC breaks even?

c. By how much has consumer surplus increased as a result of this \$420 grant?

d. What are the arguments that this \$420 grant is a good use of the government's money?

e. What are the arguments that this \$420 grant is a bad use of the government's money?

